

FORM PTO-1390

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE
 TRANSMITTAL LETTER TO THE UNITED STATES
 DESIGNATED/ELECTED OFFICE (DO/EO/US)
 CONCERNING FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER:
 EdV/HC BET 01/0596

U.S. APPL. NO. If known, see 37 CFR 1.55
 09/914040

INTERNATIONAL APPLICATION NO.:
 PCT/FR00/00597

INTERNATIONAL FILING DATE:
 10 MARCH 2000 (10.03.00)

PRIORITY DATE CLAIMED:
 11 MARCH 1999 (11.03.99)

TITLE OF INVENTION: BOX FOR SET OF ELECTRIC STORAGE BATTERIES

APPLICANT(S) FOR DO/EO/US: Claude Maurice DREULLE and Pierre Georges LENAIN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau *--in French language*).
 - b. ☐ has been transmitted by the International Bureau. (see attached copy of PCT/IB/308)
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Item 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
- ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT/IPEA/409--*in French language*), INTERNATIONAL SEARCH REPORT (PCT/ISA/210), APPLICATION DATA SHEET, ABSTRACT

U.S. APPLICATION NO. (if known, give 37 CFR 1.51)

09/914040

INTERNATIONAL APPLICATION NO.
PCT/FR00/00597ATTORNEY'S DOCKET NO
EdV/HC BET 01/059617. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):**

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$ 1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$ 860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$ 710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$ 690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$ 100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

CLAIMS

NUMBER FILED

NUMBER EXTRA

RATE

\$

Total claims 9 - 20 = 0 X \$18.00 \$

Independent claims 1 - 3 = 0 X \$80.00 \$

MULTIPLE DEPENDENT CLAIMS(S) (if applicable) + \$270.00 \$

TOTAL OF ABOVE CALCULATIONS =

\$ 860.00

Reduction of 1/2 for filing by small entity, if applicable. Applicant claims Small Entity Status under 37 CFR 1.27. +

\$

SUBTOTAL =

\$ 860.00

Processing fee of \$130 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.49(f)).

\$

TOTAL NATIONAL FEE =

\$ 860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ 40.00

TOTAL FEES ENCLOSED =

\$ 900.00

Amount to be
refunded:

charged:

a. ☒ A check in the amount of \$ **900.00** to cover the above fees is enclosed.b. ☐ Please charge my Deposit Account No. **25-0120** in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required by 37 CFR 1.16 and 1.17, or credit any overpayment to Deposit Account No. **25-0120**. A duplicate copy of this sheet is enclosed.

SEND ALL CORRESPONDENCE TO:

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August 22, 2001

By

Benoît Castel
Benoît Castel
Attorney for Applicant
Registration No. 35,041**Customer Number: 000466**

09/914040
JCC3 Rec'd PCT/PTO 22 AUG 2001

PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Claude DREULLE et al.

Box Non-fee Amendment

Serial No. (unknown)

GROUP

Filed herewith

Examiner

BOX FOR SET OF ELECTRIC STORAGE BATTERIES

PRELIMINARY AMENDMENT

Commissioner for Patents

Washington, D.C. 20231

Sir:

Prior to the first Official Action and calculation of the filing fee, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 1, after line 26, between paragraphs 5 and 6, please insert the below new paragraph:

--Document JP-A-60236454 shows a box comprising rails for receiving removable supports, in which the batteries are placed, and not the batteries themselves. Its is purely an element for storing batteries that allows a visual check of the number and condition of the batteries it contains.--

IN THE CLAIMS:

Cancel claims 1-9.

09/914040

ADD NEW CLAIMS 10-18:

--10. A box for a set of electric storage batteries (34) for an electric self-propelled vehicle, comprising at least two mutually opposite side walls (14, 16) extending substantially parallel and defining between themselves a housing for receiving batteries, characterized in that each side wall (14, 16) is internally provided with a series of projecting support elements (30, 32) extending along the wall, each support element (30, 32) forming, jointly with a support element (30, 32) of the other side wall, a support for at least one layer of storage batteries (34).--

--11. The box as claimed in claim 10, characterized in that the support elements (30, 32) consist of shelves which are inserted.--

--12. The box as claimed in claim 10, characterized in that the support elements (30, 32) are formed by longitudinal folds in the side walls.--

--13. The box as claimed in claim 10, characterized in that the support elements extend along the walls (14, 16) at an inclined angle to the horizontal.--

--14. The box as claimed in claim 10, characterized in that the support elements also comprise battery holding means (36) arranged in the vicinity of at least one of the free ends of the side walls (14, 16).--

--15. The box as claimed in claim 10, characterized in that it also comprises two end plates (22, 24) mounted on the free ends of the side walls.--

--16. The box as claimed in claim 15, characterized in that at least one of the end plates (22, 24) is mounted detachably on the side walls (14, 16).--

--17. The box as claimed in claim 15, characterized in that the end plates are each provided with a handling point (44, 46) designed to be engaged by a lifting apparatus.--

--18. A system of boxes for a set of electric storage batteries for an electric self-propelled vehicle, characterized in that it comprises a modular set of electrically connected boxes (10) as claimed in claim 10.--

Claude DREULLE et al.

REMARKS

Claims 1-9 have been canceled. Claims 10-18 have been added.

Respectfully submitted,

YOUNG & THOMPSON

By

Benoît Castel

Benoît Castel
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703/521-2297

August 22, 2001

WO 00/54348

PCT/FR00/00597

Box for set of electric storage batteries

The present invention relates to a box for a set of electric storage batteries for an electric self-propelled vehicle, such as a maintenance machine, the box being particularly suitable for holding batteries made of sealed gas-recombination elements.

It also relates to a modular system of boxes made up of a combination of such boxes.

In the prior art, sets of batteries are made up of a combination of rechargeable self-contained elements each capable of delivering a voltage of about 2 volts, all arranged in parallel or in series in a box, and this box fits into a location provided in the vehicle for this purpose to act as the vehicle's power source.

As will be appreciated, in order to keep the number of battery charging and discharging cycles to a minimum, and therefore increase their life, as many elements as possible must be carried on the vehicle.

However, increasing the number of elements has the effect of increasing the amount of heat evolved during operation.

In view of the above, the object of the invention is to provide a box for a set of electric storage batteries capable of containing a large number of batteries while at the same time allowing the heat evolved during operation to be evacuated efficiently.

Its subject is therefore a box for a set of electric storage batteries for an electric self-propelled vehicle, comprising at least two mutually opposite side walls extending substantially parallel and defining between themselves a housing for receiving batteries,

characterized in that each side wall is internally provided with a series of projecting support elements extending along the wall, each support element forming, jointly with a support element of the other side wall,
5 a support for a layer of storage batteries.

The box according to the invention may also include one or more of the following characteristics, taken in isolation or in all technically possible combinations:

10

- the support elements consist of shelves which are attached on the side walls;

15

- the support elements are formed by longitudinal folds in the side walls;

- the support elements extend along the walls at an inclined angle to the horizontal;

20

- the support elements also comprise battery holding means arranged in the vicinity of at least one of the free ends of the side walls;

25

- it also comprises two end plates mounted on the free ends of the side walls;

- at least one of the end plates is mounted detachably on the side walls;

30

- the end plates are each provided with a handling point designed to be engaged by a lifting apparatus.

35

The invention also relates to a system of boxes for a set of electric storage batteries for an electric self-propelled vehicle, characterized in that it comprises a modular set of electrically connected boxes as defined above.

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Other features and advantages will be found in the following description, given solely by way of example, with reference to the appended drawings, in which:

- 5 - Figure 1 is an exploded perspective view of a box for a set of batteries in accordance with the invention;
- 10 - Figure 2 is a longitudinal section through the support shown in figure 1, in the assembled condition;
- Figure 3 is a side view of the box shown in figure 1, in the assembled condition;
- 15 - Figure 4 is an exploded perspective view of another embodiment of a box according to the invention; and
- Figure 5 is a side view of the box shown in figure 4.
- 20 Figures 1 - 3 show a first embodiment of a box in accordance with the invention, denoted by the general reference number 10, in what will be assumed to be a vertical position.
- 25 The box is designed to accommodate a set of electric storage batteries consisting for example of sealed gas-recombination elements. The box is designed to be placed in an electric self-propelled machine, such as a maintenance machine.
- 30 The box 10 consists mainly of a case 12 having the general form of a rectangular profile with two side walls 14 and 16, an upper wall 18 and a bottom 20.
- 35 Two end plates 22 and 24 are attached, e.g. by screws to the free ends of the case 12, by means of fixing lugs such as 26 provided on the case 12 near the free ends of the side walls 14 and 16. At least one of the

end plates 22 and 24 can be removed from the case 12.

It will be observed that the box 10 is made of a material appropriate for the intended use, for example a metal or a plastic.

As is also visible in figures 2 and 3, support elements such as 30 and 32 are attached to each of the side walls 14 and 16 at regular intervals along the height of the walls 14 and 16, each support element extending along the corresponding wall and forming, jointly with a support element on the other side wall, a support on which one or more layers of storage batteries such as 34 rest.

As shown particularly in figure 3, the support elements 30 and 32 forming one battery layer extend towards each other in the same plane and are separated from each other by a distance smaller than the length, or the width, of the batteries.

The support elements 30 and 32 preferably extend along the side walls 14 and 16 at an inclined angle to the horizontal to enable easy loading of the box 10.

Holding means denoted by the general reference number 36 are provided at at least one end of the support elements 30 and 32 in order to hold the battery elements in position.

As an example and as illustrated, these holding means 36 consist of stops mounted removably or non-removably on the support elements 30 and 32 and take the form of rods 38 and 40 extending down through the support elements 30 and 32.

The assembled case 12 and end plates 22 and 24 constitutes the box, and the box can accommodate a

relatively large number of electric storage batteries in the form of several layers of batteries, each supported by two support elements 30 and 32.

5 It will be realized that this box 10 allows heat generated during operation to be evacuated by allowing air to circulate through the space left between the layers of batteries corresponding to the thickness of the support elements 30 and 32.

10

In order to improve the ventilation of the batteries, the end plates 22 and 24 may advantageously be fitted with ventilation openings such as 42.

15 The box 10 may also be provided with handling points consisting of orifices 44 and 46 in the end plates 22 and 24 to accommodate a hook of a lifting apparatus for placing the box in an electric vehicle as its power supply and for replacing the latter.

20

In the illustrative embodiment shown in figures 1 and 2, the support elements consist of shelves inserted and fixed by for example welding to the side walls 14 and 16.

25

As illustrated in figures 4 and 5, which show another embodiment of the box according to the invention, and in which parts identical to those in figures 1-3 are given the same reference numbers, the support elements 30 and 32 can also be formed by folding the side walls 14 and 16.

30

It will also be seen that the support elements 30 and 32 can be made in such a way that they extend horizontally along the side walls.

35

The battery holding means may also be formed in the form of spaces, such as 48, extending between the side

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walls 14 and 16 on each battery rack.

5 Lastly, it will be observed that, depending on the amount of space available in the vehicle and the electric power to be delivered, a modular system of boxes can be made by combining several boxes identical to those described above and connecting them electrically in series or in parallel.

10 It will be understood that the invention described above, which uses a box having side plates, at least one of which is removable, and having battery supports allowing a relatively large number of batteries to be loaded into a small space while enabling efficient
15 ventilation thereof, greatly increases the life of the battery stored in this way, in that it greatly limits the number of cycles of discharging and recharging.

20 It also makes the operation of installing the battery elements very easy to carry out and greatly facilitates maintenance because the presence of the ventilation openings in the side plates makes the batteries accessible from the exterior.

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CLAIMS

1. A box for a set of electric storage batteries (34)
for an electric self-propelled vehicle, comprising
at least two mutually opposite side walls (14, 16)
extending substantially parallel and defining
between themselves a housing for receiving
batteries, characterized in that each side wall
(14, 16) is internally provided with a series of
projecting support elements (30, 32) extending
along the wall, each support element (30, 32)
forming, jointly with a support element (30, 32)
of the other side wall, a support for at least one
layer of storage batteries (34).
2. The box as claimed in claim 1, characterized in
that the support elements (30, 32) consist of
shelves which are inserted.
3. The box as claimed in claim 1, characterized in
that the support elements (30, 32) are formed by
longitudinal folds in the side walls.
4. The box as claimed in any one of claims 1-3,
characterized in that the support elements extend
along the walls (14, 16) at an inclined angle to
the horizontal.
5. The box as claimed in any one of claims 1-4,
characterized in that the support elements also
comprise battery holding means (36) arranged in
the vicinity of at least one of the free ends of
the side walls (14, 16).
6. The box as claimed in any one of claims 1-5,
characterized in that it also comprises two end
plates (22, 24) mounted on the free ends of the
side walls.

7. The box as claimed in claim 6, characterized in that at least one of the end plates (22, 24) is mounted detachably on the side walls (14, 16).
- 5
8. The box as claimed in either of claims 6 and 7, characterized in that the end plates are each provided with a handling point (44, 46) designed to be engaged by a lifting apparatus.
- 10
9. A system of boxes for a set of electric storage batteries for an electric self-propelled vehicle, characterized in that it comprises a modular set of electrically connected boxes (10) as claimed in
- 15
- any one of claims 1-8.

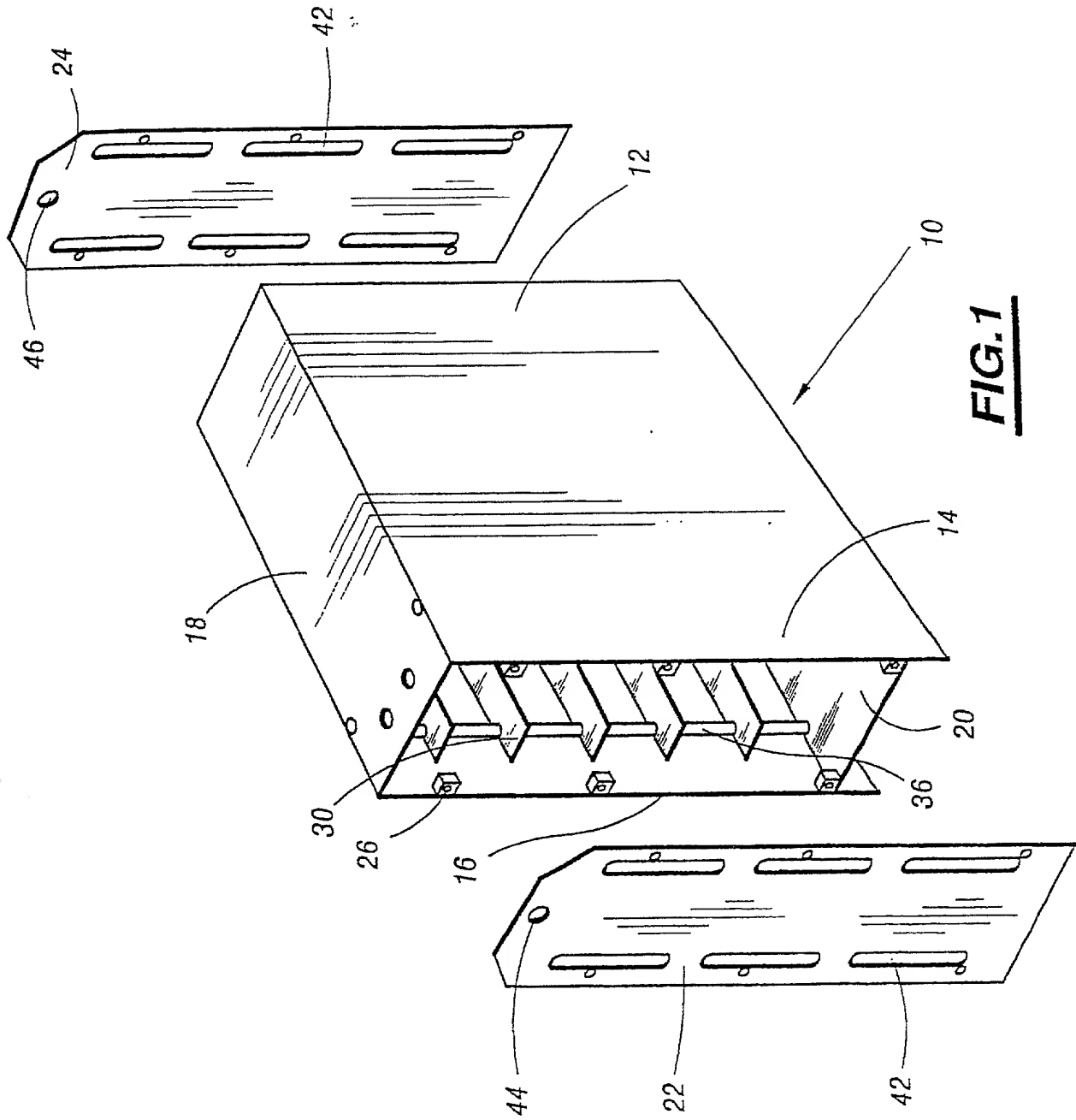
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ABSTRACT

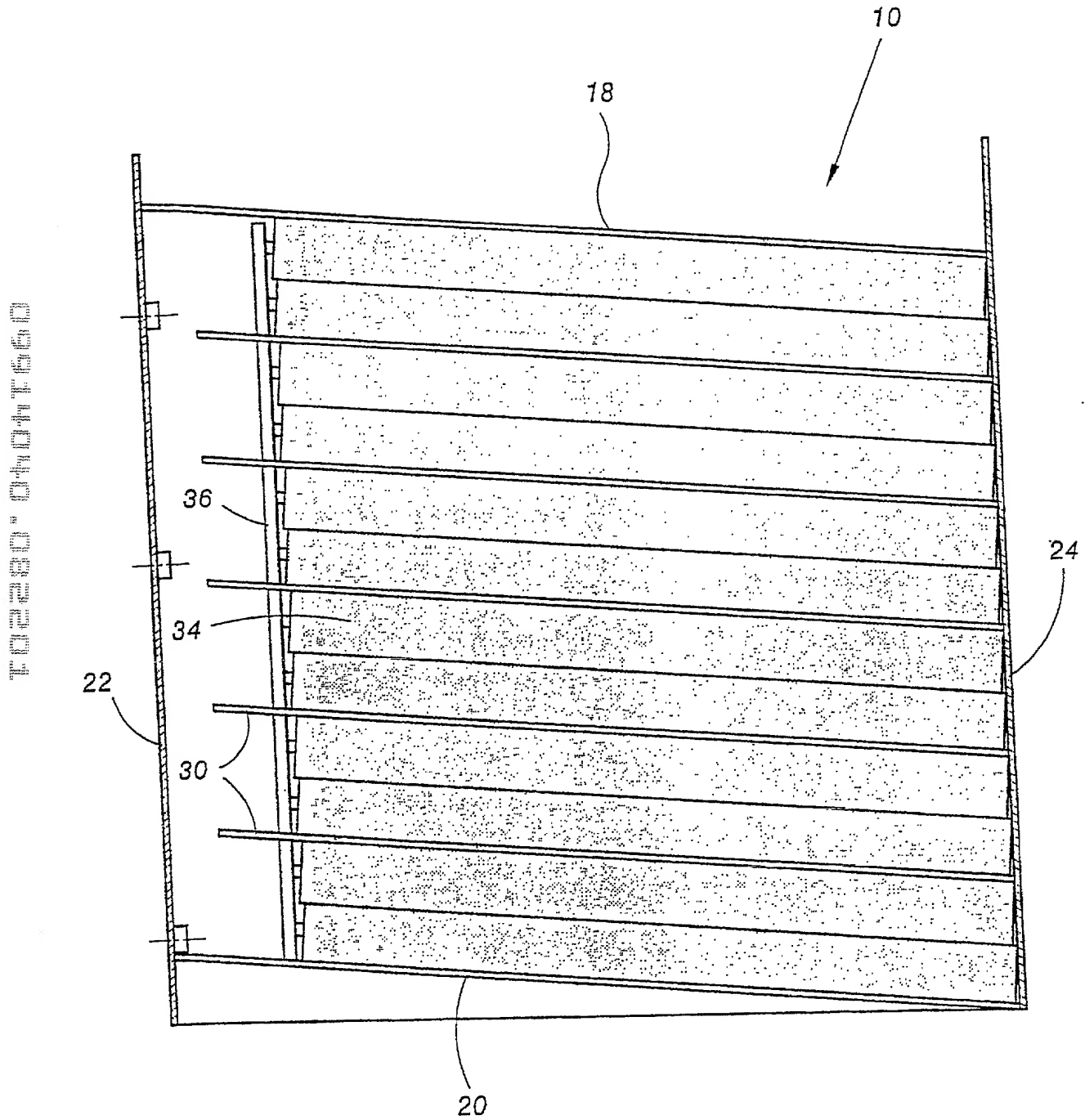
A box for a set of electric storage batteries for an electric motor vehicle includes at least two mutually opposite side walls (14, 16) extending substantially parallel and defining between them a housing for receiving batteries. Each side wall (14, 16) is internally provided with a series of projecting support elements (30, 32) extending along the wall, each support element (30,32) forming, jointly with a support element of the other side wall, a support for at least one rack of storage batteries.

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FIG. 1



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**FIG. 2**

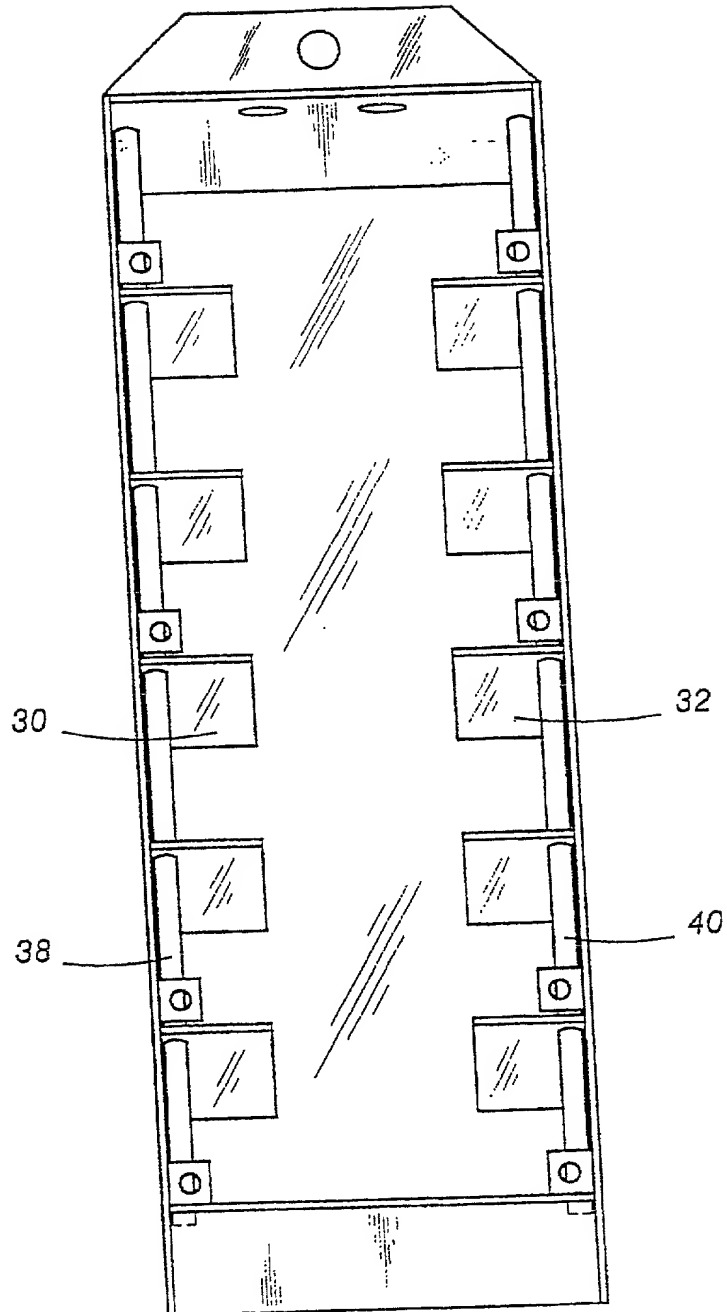
**FIG. 3**

FIG.4

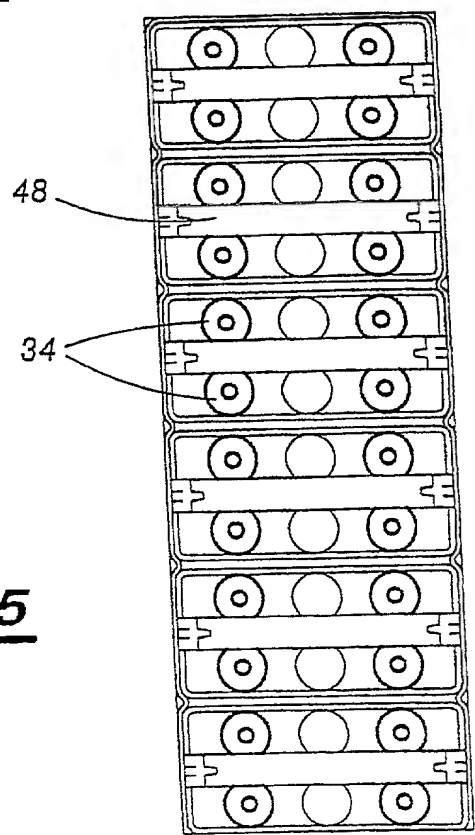
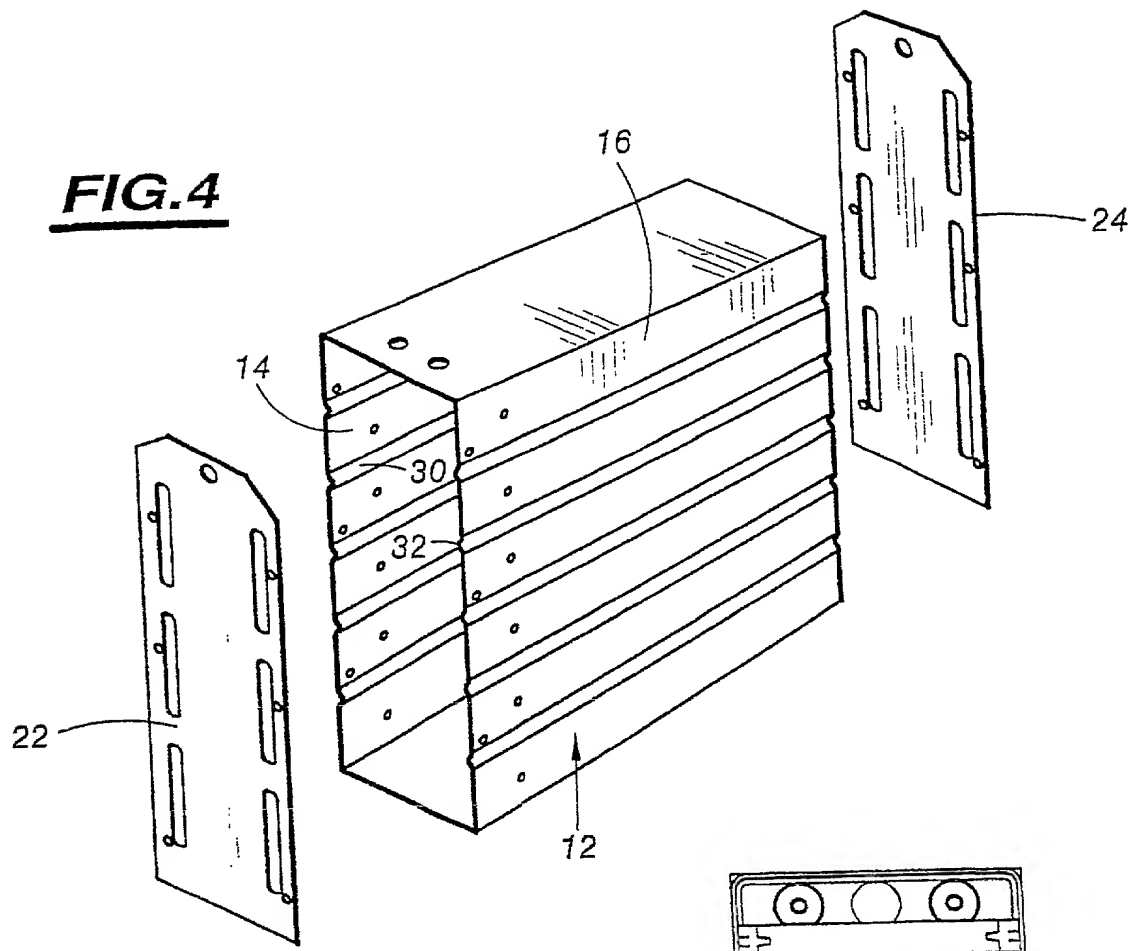


FIG.5

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"Box for set of electric storage batteries".

the specification of which: *(check one)*

REGULAR OR DESIGN APPLICATION

- [x] is attached hereto.
- [] was filed on _____ as application Serial No. _____ and was amended on _____ (if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STAGE

- [x] was described and claimed in International application No. PCT/FR00/00597 filed on March 10, 2000 and as amended on _____ (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

PRIORITY CLAIM

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed
FRANCE	99 03 013	March 11, 1999	Yes

(Complete this part only if this is a continuing application.)

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status--patented, pending, abandoned)

POWER OF ATTORNEY

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from _____ as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the registered patent attorneys represented by Customer No. **000466** to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, including: **Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, Benoît CASTEL, Reg. No. 35,041, Eric JENSEN, Reg. No. 37,855, Thomas W. PERKINS, Reg. No. 33,027, and Roland E. LONG, Jr., Reg. No. 41,949,**

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00466

PATENT TRADEMARK OFFICE

Address all telephone calls to Young & Thompson at 703/521-2297. Telefax: 703/685-0573.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Claude, Maurice DREULLE
(given name, family name)

Inventor's signature _____ Date August 1st, 2001

Residence: 71, av. François Mitterand - 62217

Citizenship: French

BEAURAINS France FRX
Post Office Address: The same as above

Full name of second joint inventor, if any: Pierre, Georges LENAIN
(given name, family name)

Inventor's signature _____ Date August 1st, 2001

Residence: 44, rue Clémenceau - 62000 ARRAS FRANCE FRX Citizenship: French

Post Office Address: The same as above

Full name of third joint inventor, if any:
(given name, family name)

Inventor's signature _____ Date _____

Residence: _____ Citizenship: _____

Post Office Address: _____

Full name of fourth joint inventor:
(given name, family name)

Inventor's signature _____ Date _____

Residence: _____ Citizenship: _____